

REMARKS

Claims 1-17 are pending in the application.

Claims 13-16 are withdrawn from consideration.

Claim 5 is rejected under 35 U.S.C. 112.

All of the claims are rejected under 35 U.S.C. 103(a).

Claims 1, 3, 4, 5, 10, and 17 are amended.

Claim 2 is canceled.

Claims 1, 2-12 and 17 remain in the case for consideration and new claims 18-20 are added by this amendment.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Claim Rejections - 35 USC § 112

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant amends Claim 5 to correct the indefiniteness.

Claim Rejections - 35 USC § 103

Claims 1-12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (6780748) and Cho (6400021).

First, applicant has amended claims 1 and 10 to further define the embossed area and the concave and convex portions.

Second, applicant respectfully traverses the Examiner's statement on page 6 of the office action that "the convex portion [is] formed of the second patterned dielectric layer 30" in Cho. Dielectric layer 30 in Cho is formed directly on protection layer 20, which corresponds to applicant's passivation layer. In Cho, upper dielectric layer 50 is the second dielectric layer. But it does not include a convex portion; as noted by the examiner, that is in layer 30, which is the first dielectric layer. As a result, the combination of Yamaguchi and Cho does not teach the invention defined in the claims as amended.

New claims 18 and 19 further define the invention with emphasis on the features that increase contact area. Specifically, claim 19 is directed to annular convex and concave portions and further includes vertical walls. The ball pad is defined as being formed on all of these surfaces. New claim 20, like claim 4, defines an area for forming a ball pad that is even further maximized by discontinuities formed in the convex portion. This creates additional

substantially vertical walls upon which the ball pad can be formed thus even further increasing the bonded surface area.

Claim 17 is amended to define annular concave and convex portions and is allowable at least for the same reasons that support allowability of claims 1 and 10.

Applicant also traverses the examiner's statement that the various shapes defined in the claims are obvious matters of design choice. What is more, the examiner has characterized these limitations as "dimensions" (O.A., page 7). Applicant's claim limitations, however, define shapes that substantially increase the contact area of the ball with the metal over those shapes shown in the prior art. Reconsideration of these rejections is requested, especially in view of the amendments to the independent claims.

Claims 3, 4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi and Cho as applied to claim 2, and further in combination with Peng (6444295).

The Examiner alleges that Peng discloses a concave portion comprising a circle shape and a convex portion comprises a ring shape or a discontinuous ring shape, citing Figure 2(a) and element 320. Although Applicant acknowledges that the pattern 600 indicated in Figure 2(a) can be of various shapes, Peng does not disclose forming the various patterns, including the ring shape or a discontinuous ring shape, in the embossed portion of the dielectric layer as recited in Claims 3-4. Peng describes that the upper metal layer 310... includes a regular or an irregular layout pattern 600 formed thereon (as shown in FIG. 2(b)). Col. 3, lines 30-32. Therefore, Peng discloses forming irregular patterns in the metal layer instead of the dielectric layer. As such, Peng does not disclose the limitations recited in Claims 3-4.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-12 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

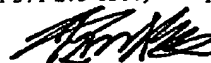
Respectfully submitted,
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I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via facsimile number 571-273-8300, on September 12, 2005.



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